

Application No: 10/663,024

Docket No.: Q201-US1

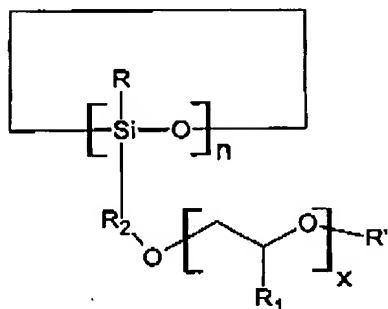
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IN THE CLAIMS

Please amend the claims as follows:

1. (currently amended) A electrochemical device, comprising: an electrolyte including a cyclic polysiloxane having side chains that each includes ~~include~~ a poly(alkylene oxide) moiety and a spacer positioned between the poly(alkylene oxide) moiety and a silicon on a main chain of the polysiloxane,

the polysiloxane having a structure represented by the formula:



wherein R is an alkyl or aryl group; R' is an alkyl or aryl group; R₁ is hydrogen or an alkyl group; R₂ represents the spacer and consists of one or more CH₂ groups; n is up to 100; and x is up to 30.

2.-3. (canceled)

4. (previously presented) The device of claim 1, wherein the spacer includes 2 or more CH₂ groups.

5. (previously presented) The device of claim 1, wherein the spacer includes 6 or fewer CH₂ groups.

6. (canceled)

7. (previously presented) The device of claim 1, wherein the cyclic polysiloxane is cross-linked.

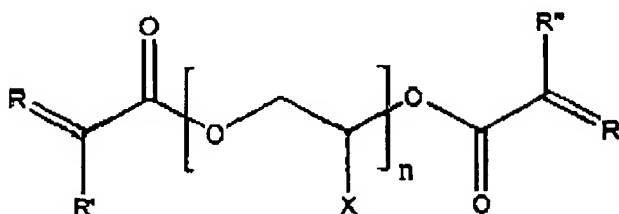
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8. (canceled)
9. (previously presented) The device of claim 1, wherein the electrolyte is a liquid.
- 10.-12. (canceled)
13. (previously presented) The device of claim 1, wherein the electrolyte includes at least one alkali metal salt.
14. (previously presented) The device of claim 13, wherein the alkali metal salt is selected from a group consisting of: LiClO_4 , LiBF_4 , LiAsF_6 , LiPF_6 , LiCF_3SO_3 , $\text{Li}(\text{CF}_3\text{SO}_2)_2\text{N}$, $\text{Li}(\text{CF}_3\text{SO}_2)_3\text{C}$, $\text{LiN}(\text{SO}_2\text{C}_2\text{F}_5)_2$, lithium alkyl fluorophosphates, lithium bis(chelato)borates, $\text{LiPF}_3(\text{C}_2\text{F}_5)_3$, and $\text{LiPF}_3(\text{CF}_3)_3$.
15. (previously presented) The device of claim 1, wherein the electrolyte includes a lithium bis(chelato)borate having 5 to 10 membered rings.
16. (previously presented) The device of claim 1, wherein the electrolyte includes a lithium bis(chelato)borate having 5 to 7 membered rings.
17. (previously presented) The device of claim 1, wherein the cyclic polysiloxane is entrapped within at least one cross-linked network polymer.
18. (previously presented) The device of claim 17, wherein the electrolyte is a solid.
19. (withdrawn) The device of claim 17, wherein the at least one network polymer includes a poly(methacrylate).
20. (withdrawn) The device of claim 17, wherein the network polymer is formed from a monomer represented by general formula:

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wherein R is an alkyl group having 1 to 10 carbon atoms; each of R' and R'' is selected from the group consisting of: hydrogen, an alkyl group having 1 to 10 carbon atoms, and an alkenyl group having 2 to 12 carbon atoms; X is hydrogen or a methyl group; and n is 1 to 15.

21. (previously presented) The device of claim 17, wherein the network polymer includes a cross-linked polysiloxane.

22. (previously presented) The device of claim 17, wherein the network polymer includes a polysiloxane where at least a portion of the main chain silicons are linked to side chains that each include a poly(alkylene oxide) moiety.

23. (previously presented) The device of claim 22, wherein at least a portion of the main chain silicons are bonded to a cross-linker having a moiety selected from the group consisting of: $O-(CH_2CH_2O)_q$ and $Si-O-(Si-O)_k-Si$, where q is at least 4 and less than 30, and k is at least 5 and less than 30.

24. (previously presented) The device of claim 22, wherein n of the main chain silicons are bonded to a cross-linker and m of the main chain silicons bonded to a side chain, a ratio of n:m being in a range of 1:4 to 1:200.

25. (previously presented) The device of claim 24, wherein the ratio of n:m is in a range of 1:6 to 1:100.

26. (previously presented) The device of claim 1, wherein the electrolyte further includes:

at least one solid polymer.

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27. (previously presented) The device of claim 26, wherein the at least one solid polymer is selected from the group consisting of: polyacrylonitrile (PAN), poly(methyl methacrylate) (PMMA), poly(vinylidene fluoride) (PVdF), poly(vinylidene fluoride-co-hexafluoropropylene), poly(vinyl acetate), polystyrene, and poly(ethylene oxide) (PEO).
28. (previously presented) The device of claim 1, wherein the average molecular weight of the cyclic polysiloxane is less than or equal to 20,000 g/mol.
29. (previously presented) The device of claim 1, wherein the dynamic viscosity of the cyclic polysiloxane is less than or equal to 10,000 cps.
30. (currently amended) The device of claim 1, wherein a ~~molar ratio of~~ [EO]/[Li] ratio is 5 to 50,
 [EO] being a molar concentration in the electrolyte of active oxygens in the polysiloxane, and
 [Li] being a molar concentration of the lithium in the electrolyte.
31. (previously presented) The device of claim 1, further comprising:
 at least one lithium metal oxide cathode, at least one porous separator, and at least one anode.
32. (previously presented) The device of claim 31, wherein the at least one anode comprises at least one material selected from the group consisting of: carbon and lithium metal.
33. (previously presented) The device of claim 1, wherein the electrolyte includes a blend of polysiloxanes.
- 34.-44. (canceled)

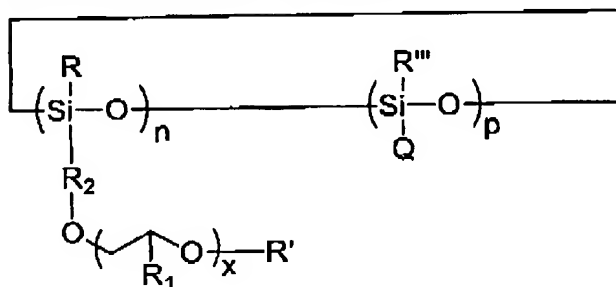
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45. (previously presented) The device of claim 1, wherein the spacer includes 3 or more CH₂ groups.

46. (previously presented) The device of claim 1, wherein R₁ is hydrogen.

47. (currently amended) The device of claim 1 ~~claim 46~~, wherein the electrolyte further includes a polysiloxane having a structure represented by the formula:



wherein R is an alkyl group, R' is an alkyl or aryl group, R''' is alkyl or hydrogen; R₁ is hydrogen or an alkyl group; R₂ is a spacer made up of one or more CH₂ groups; p is greater than 0; n is from 1 to 100; x is from 1 to 30; and Q is a cross-linker linking the polysiloxane to another polysiloxane.

48. (previously presented) The device of claim 47, wherein the electrolyte is a solid.

49. (previously presented) The device of claim 47, wherein at least a portion of the cross-linkers include a moiety selected from the group consisting of O-(CH₂CH₂O)_q and Si-O-(Si-O)_k-Si, where q is at least 4 and less than 30, and k is at least 5 and less than 30.